
The Collection and Use of School Level Data

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Executive Summary

In recent years, a number of states have begun to collect school-level data in an effort to learn more about the financial operation of schools and to hold schools and school districts more accountable for student performance. The state of Washington is also looking at this issue. The Joint Legislative Audit and Review Committee (JLARC) has been authorized by the legislature to conduct a study of the system of finance for Washington common schools. As part of that study, committee staff and consultants are looking at school-level data collection in districts across the state today as well as at the practices of other states across the nation.

This paper provides a general overview of the issues surrounding the collection of school-level data from schools and school districts. In addition to describing what might be gained from such collections, it discusses in general terms the problems some states have had in implementing such collection efforts and it identifies a number of complex issues that must be resolved if a school-level data collection system is established.

Why Collect School Level Data?

The collection of school-level data is much more than the simple collection of data on school-level revenues and expenditures. In addition to basic fiscal data, school-level data systems need information about school (and district) staff and students. School level data has been called for to answer questions in seven areas:

- **Governance:** Providing information on the success of site based management and other organizational reforms.
- **Accountability:** Helping state policymakers collect information on the performance of school sites as they strive to identify schools that are successful in improving student outcomes.
- **Efficiency and Productivity (Effectiveness):** Providing better fiscal and school characteristic data for analyses of how money matters in schools.
- **Equity:** Understanding and measuring whether the distribution of educational resources is equitable in meeting the needs of all the children of an individual state.
- **Adequacy:** Helping resolve the question of how much it costs to provide children with a basic minimum level of education.
- **Comparability:** Resolving problems that result at present when one tries to compare resource allocation patterns across school in different school districts within the same state.
- **Longitudinal Analyses:** Providing data that would improve our ability to look at how the resources devoted to public education are used over time.

Issues to Resolve in the Collection of School Level Data

Despite all of the potential for school level data, it is not certain that once the data are collected we will be able to answer all of the questions we have or that we could pose. It will be very expensive to collect data at the school site level, and once collected, it is not always clear how – or if – it will be used. Moreover, simply collecting data from schools does not insure its comparability.

Establishing a clear definition of a school may be problematic given the vast range of grade level structures used by schools today, and the many market based options such as choice, vouchers and tuition tax credits, being considered and even implemented today. If a definition of schools can be developed, states still need to grapple with issues surrounding the complexity of school level reporting systems, establishing the data collection infrastructure, training staff who will have to make the system work, and developing clear guidelines to protect the privacy of the records kept and maintained.

How Would School Level Data Be Used?

Given the paucity of school level data at the present time, there are few good examples of how such data could be used. Federal studies looking at the relationship of pupil/teacher ratios to teacher reported class size show that the self reported class size is approximately 50 percent higher than the ratios computed with the number of teachers and students at the school site. Factors impacting this difference appear to be special education classes and teachers with quasi-administrative assignments.

Using individual state level data bases, researchers in Florida concluded that there were few differences in spending pattern at the school level, while research in California found that while spending patterns were reasonably consistent, there were substantial differences in expenditures per pupil among schools within districts and across schools across districts. In New York, researchers observed that there are considerable differences in the level of teacher resources devoted to different academic subjects across high schools. Recent analyses of special education expenditures using Ohio's school level data provide new evidence of the differences in costs for treating children with similar disabilities, and the number of personnel involved in special education programs.

Analyses in individual school districts suggest that school level comparisons show inequalities in resource allocation and that there is considerable misunderstanding among parents and local communities about how funds are distributed to schools and how schools use those funds. This work has also found that despite considerable rhetoric about site based management, school site control over resources only takes place at the margins, with most fiscal decisions still being made at the district level.

Conclusion

Despite all of the potential for school level data, it is not certain that once the data are collected we will be able to answer all of the questions we have or that we could pose. Data collection is only a valuable activity if it is accompanied by clear, well thought out analyses using those data. It is unclear what types of analyses the key stakeholders in Washington want to have conducted. The legislature generally wants to know that the funds they appropriate are being well used, but this has focused mainly on district-level data and the analyses are ad hoc. Moreover, OSPI does not have a capability to conduct analyses with the data they maintain. Until there is a better understanding of how the data will be used, pursuing school-level data may be premature.

The Collection and Use of School-level Data

In recent years, a number of states have begun to collect school-level data in an effort to learn more about the financial operation of schools and to hold schools and school districts more accountable for student performance. The state of Florida has been collecting these data for over 20 years, while other states entered the fray more recently. Ohio and Texas currently have school level databases, while South Carolina is in the process of establishing a school level data (Tetreault, 1998a). Oregon is currently in the process of developing a comprehensive, school level fiscal system for its schools as well.

The state of Washington is also looking at this issue. The Joint Legislative Audit and Review Committee (JLARC) has been authorized by the legislature to conduct a study of the system of finance for Washington common schools. As part of that study, committee staff and consultants are looking at school-level data collection in districts across the state today as well as at the practices of other states across the nation. This working paper was commissioned to provide a general overview of the issues surrounding the collection of school-level data from schools and school districts. It seeks to inform readers about the uses of school-level data. In addition to describing what might be gained from such collections, it discusses in general terms the problems some states have had in implementing such collection efforts and it identifies a number of complex issues that must be resolved if a school-level data collection system is established.

The balance of this paper is divided into four sections. The first summarizes current thinking about the benefits of school-level data collection efforts, while the second offers a summary of the complexities and issues that need to be resolved in the design of a school-level data collection system. The third section summarizes the research that has been undertaken to date using school-level data from states where such data exist, while the fourth provides some conclusions about the value of moving in this direction in Washington.

The paper does not make a recommendation as to what the state should do in terms of its educational data collection efforts. Rather, it seeks to provide an objective discussion of the potential uses of these data and the issues involved in their collection. The state already collects considerable district level data which might be more productively used by analysts to answer policymaker's questions before the effort and expense of collecting school-level data is considered. This paper is part of a larger JLARC study, the goal of which is to better understand how schools in Washington use the resources at their disposal for the education of the state's children.

Why Collect School-level Data?

Recent research from the private sector suggests that devolving more responsibility to the unit of production often results in more efficient and profitable production (Lawler, 1986). More information about the fiscal status of individual schools could help answer questions about the impact additional revenues might have on student performance. The ability to analyze inputs and outputs of the educational system closer to the "unit of production" – the school building rather than the district – is an attractive reason for considering school level data collections. Similarly, school level analyses will help focus attention on the

outputs or student outcomes of each school individually and on the relationship between inputs and outputs or outcomes.

The collection of school-level data is much more than the simple collection of data on school-level revenues and expenditures. In addition to basic fiscal data, school-level data systems need information about school (and district) staff and students. Staffing databases – which are more frequently available at the school-level than are fiscal databases – need to include information about both certificated and classified staff. At a minimum, it seems information would be needed about type of assignments, salary level, qualifications and education, and the full time equivalent percentage of time an individual works. Washington State already maintains some of this information at the school level. Similarly student databases would need to provide accurate counts of enrollments, student counts for state attendance purposes (which is typically different from enrollment), course enrollments, information about the students demographic and socio-economic status, and assessment data. Fortunately, today the technology exists for collecting and using school level data.

Collecting all of these data at the school level is highly labor intensive and consequently very expensive. Why should a state consider entering into an effort of this magnitude and what would it gain if it did so? Will the benefits of having these data be worth the substantial cost of its collection? It is helpful to first consider some of the limitations of systems that only collect data at the district level.

The Limits of District-Level Data

School finance has traditionally focused on the school district. Most school funding formulas distribute money to districts. To date, school finance equity efforts have focused on district level equity. Realizing the limits of district level data, the Finance Center of the Consortium for Policy Research in Education (CPRE)¹ sought to develop a better understanding of how educational resources are allocated and used. Using a multi-level approach, research teams analyzed large Federal databases including the Bureau of the Census reports on government spending and the School and Staffing Survey (Picus, 1993a & 1993b). They also attempted to analyze finance and staff data collected by individual states that had – or claimed to have – school-level data capability (Hertert, 1996; Nakib, 1996; Monk, Roellke and Brent, 1996; Odden, Monk, Nakib and Picus, 1995). Finally, teams of researchers conducted multi-year case studies in four school districts in each of three states (Firestone, Goertz, Nagle, & Smelkinson, 1994; Adams, 1994; Picus, 1994a).

CPRE researchers were surprised to find that at the district level school districts look more alike than different. On average, school districts spend about 60 percent of their funds on instruction and the remaining 40 percent on all other educational services including administration, maintenance and operations, instructional support, transportation, food services and others. This pattern is unrelated to location or level of spending. For example, even though New Jersey spends roughly twice as much per pupil as California, the same 60/40 ratio exists. This does not mean that things are the same in those two

¹ CPRE, the Consortium for Policy Research in Education, is a consortium of six universities who conduct research on educational policy. Funding for CPRE comes from a variety of sources including: its status as one of the United States Department of Education's national research centers funded through the Office of Educational Research and Improvement(OERI); other Federal contracts and grants; funding from foundations; and direct work for individual states and school districts. The Finance Center is one component of CPRE's work and is headquartered at the University of Wisconsin under the direction of Allen Odden.

states. The higher spending level in New Jersey allows school districts to offer smaller classes and pay teachers more compared to California. Moreover there is a much richer mix of support services available to schools and students in New Jersey than in California (Picus and Fazal, 1996; Odden, Monk, Nakib and Picus, 1995).

There are other limitations to the use of district level data for analyzing educational organizations. Despite a general belief that more money will lead to better educational outcomes for students, research on the relationship between spending and student performance has been unable to conclusively establish a link between the two. It is possible the lack of detailed school, classroom or student level fiscal data is one of the reasons for the conflicting results reported in the literature to date (see for example Hanushek, 1996 and Greenwald, Hedges & Laine, 1996).

To understand how resources can best be used to improve a student's education, it seems important to know what resources are available to that child. At a minimum, a greater sense of what funds and services exist at the student's school will help inform such analyses. We often have student specific information on a child's academic performance, demographic characteristics and family income. Yet when we want to know how that child's performance is related to spending, we are forced to rely on district level information. As shown above, district fiscal data shows remarkable consistency across districts, potentially masking more significant differences in resource allocation and use at the school, classroom or even student level. It is, of course possible that school level data collections will continue to show the same thing.

Site based management is becoming more popular among educators and policymakers. This movement to devolve more authority and decision making responsibility to school sites appears to be in line with current research trends in both education and the private sector. Many argue that if schools are to be managed successfully at the site level, and if states and districts are to hold schools accountable, more site specific information will be needed (Odden & Busch, 1998).

Even traditional equity analyses may suffer from the lack of school level data. Hertert (1996) shows that there are substantial differences in per pupil spending across schools within school districts and among schools across districts in California. If these expenditure differences exist in other states (and it is likely that they do), then district level data is inadequate even for traditional school finance equity analysis.

The limitations described above suggest that school level data might provide better information and data on which to base future school finance reform decisions, as well as on which to base future accountability systems and reform efforts. Below, the potential advantages of school level data collection are described.

Potential Uses of School Level Data

A number of important insights into school-level data collection have been gleaned from the district and school level work completed to date. This information is described in a series of papers commissioned by the Finance Center of CPRE and published in a special issue of the *Journal of Education Finance* (v.22, n.3; Winter 1997). Since that work was completed, many others have looked into the issues surrounding school-level data collection and its use. Busch and Odden (1997) in summarizing the CPRE commissioned papers identified seven areas where school-level data could be used to answer important questions. They include:

1. Governance
2. Accountability

3. Efficiency and productivity (effectiveness)
4. Equity
5. Adequacy
6. Comparability of data
7. Longitudinal analysis

This comprehensive list serves as an excellent guide to the potential uses of school-level data. While others have created somewhat different lists of questions and potential benefits, all of them fit under one of the seven categories listed above (see for example, Herrington, 1996; Guthrie, 1998; Isaacs, Garet, & Broughman, 1998; Randall, Cooper, Speakman & Rosenfield, 1998). Each is described in more depth below.

Governance

In the 1990s, the focus of school management has shifted from the district to the school. A number of policy or governance trends in education have resulted, including the push for site-based management,² charter schools, choice programs and vouchers. In all instances, the driving force behind these proposed reforms is the school as the unit of concern and the location for decision-making and budget control. As schools grapple with the new reality of more authority and responsibility for student results, we need to be more attentive to the provision of timely, accurate school-level information. This information is needed by school managers seeking to provide educational services to their students, and by state policymakers concerned with holding schools accountable.

Despite the growing trend to argue for holding schools accountable for student outcomes, it is unlikely (and arguably wrong) to expect that the state will relinquish audit authority over the use of public school revenues by districts and schools. Particularly in a state like Washington – where high percentage of total educational expenditures are funded by the state – Legislators will always want assurances that the funds they appropriate for schools are used as expected, that actual expenditures match budget projections or estimates, with exceptions clearly documented and properly approved. Absent accurate reports of how public funds are spent, granting substantial decision making authority to school sites is unlikely to occur as rapidly as proponents of site-based reforms would like to see.

Accountability

School-level data collection could play a major role in the design of future accountability systems. All 50 states have moved to improve educational accountability in recent years. Whether it is through school site report cards, more intensive standardized testing, or detailed analyses of district spending, school performance is being looked at more closely than ever before. By linking spending, staff and student data together at the school-level, it might be possible to ascertain how different mixes of spending and/or staff impact student outcomes.

² Site Based Management (SBM) is a commonly used term for a number of organizational options that have been implemented by school districts. Under traditional forms of school district governance, districts control most decision-making for all schools. SBM attempts to shift some of the authority for these decisions to the school site. Research has found that the three most common areas where power is devolved to school sites are personnel decisions, budgeting and curriculum (see Odden and Busch, 1998 for an excellent discussion of SBM). The nature of a school site's power, and the way that power used or shared among the principal, teachers and community varies from state to state and district to district.

A related problem facing state policymakers is insuring that the educational system, for which they still maintain overall responsibility, is meeting the needs of students, employers and society generally. Rather than simply trust school-level decisions to be right, school-level data will give policymakers the ability to compare performance across schools, and to make sure all schools are allocating and using resources appropriately.

The last point brings up a distinction between holding schools accountable for what they do and controlling to how they chose to do it. For example, site-based management argues that authority for most resource allocation decisions should rest at the school. State accountability systems need not restrict that authority, but rather can be designed to insure that the school can provide an accounting trail for the revenues and expenditures that meet the requirements of state law. School-level data systems are essential if school sites are to gain true decision-making autonomy.

Finally, Bush and Odden (1997: 231-2) sum up the value of school-level data for accountability as follows:

A school-level data system – that includes information on revenues or expenditures, personnel and personnel quality and expertise, other resource measures such as the enacted curriculum, and student achievement, especially changes in achievement over time – would allow site professionals and analysts to assess potential reasons for significant, or lack, of improvements in student achievement results, thus allowing an accountability system to be used intelligently rather than just descriptively or punitively.

Efficiency and Productivity (Effectiveness)

The efficient and productive or effective use of educational resources is of critical importance to the policy community. Several researchers have argued that school-level data would help to better understand the observed 60/40 split described above. They suggest that descriptive data at the school-level would enable us to understand how spending and resource utilization varies by grade level, type of school, program, and possibly by curricular area if collected with these goals in mind (Farland, 1997; Monk, 1997). This information could be collected and analyzed to ascertain how policy drives what schools actually do (Busch and Odden, 1997).

As many educators seek more funding for education, there are increasing calls for more efficient operation of schools, and for schools to show results in exchange for those additional funds. School-level data would also make it feasible for school decision-makers to conduct cost analyses of alternative programs and seek out the most cost effective options for delivery of services. School-level data would allow analysts to determine which schools were making the greatest gains in student achievement per dollar spent and compare their programs and curriculum with other schools.

In addition to issues of efficiency, school-level data may be helpful in resolving questions surrounding productivity or effectiveness. Despite decades of research and literally thousands of studies attempting to link student outcomes with spending, the results to date have been inconclusive (Picus, 1997b). Part of the problem is linking individual student data on achievement and characteristics with district level data on expenditures. If data on expenditures were available at the school level, it might be possible to connect resources and student outcomes more clearly (Berne, Stiefel and Mosser, 1997; Monk, 1997; and Picus, 1997a). Even if that remains elusive in the near term, it will be possible to develop a greater understanding of how different combinations of staff and other resources work to help improve student performance under different circumstances. This

will provide school leaders with more information about what programs are more likely to meet the needs of the children they serve.

Equity

The equitable distribution of resources has been the mainstay of school finance research since Cubberley began writing about funding models in 1919. Yet until recently, the focus was always on the school district. Hertert (1996) shows that even in a state like California where substantial gains have been made in establishing horizontal equity in the school funding system, dramatic differences in per pupil expenditures continue to exist across schools within districts.³ Few law suits have considered this issue, although the settlement in *Rodriguez v. Los Angeles Unified School District* in the late 1980s placed a great deal of emphasis on the equalization of spending on teacher salaries across schools in Los Angeles.

School-level equity analyses seem particularly well suited to a state like Washington where district level horizontal – and theoretically vertical – equity has been largely achieved.⁴ Are resource allocations equitable across schools in large districts? Do students have the same access to programs, teachers and curriculum offerings throughout a district, or are there substantial differences in what schools are able to offer their children. It is in analyzing these important equity issues that school-level data may be the most crucial.

One advantage school-level data would bring to equity analyses is it would allow policymakers to better measure revenues received by schools from non-traditional sources. For example, contributions from booster clubs, foundation grants, user fees, and associated student body fund fees often generate substantial, and unequal sums of revenue for schools. School-level fiscal data would allow us to better understand the implications of these non-traditional revenues on equity, across schools within a district and among schools across districts.

Adequacy

The 1990s have seen a resurgence in school finance litigation. Since 1989, a total of 21 cases have found the way to the highest court in their respective state. In 13 of those, the court decided in favor of the plaintiffs. Beginning with the 1989 landmark decision in Kentucky,⁵ courts have been more willing to overthrow the existing funding system, define remedies and establish concrete requirements for constitutional remedy. In many instances, these decisions have focused on an additional factor beyond equity in school finance – adequacy. Adequacy cases argue that it is the responsibility of the state to provide an “adequate” level of resources to insure each child receives a satisfactory education. As envisioned by William Clune (1994), adequacy shifts the focus of school finance reform from inputs to an emphasis on high minimum outcomes. Although this

³ Horizontal equity in school finance refers to the equal treatment of students. Typically horizontal equity is achieved when spending per pupil is roughly equal for all students with similar characteristics.

⁴ Vertical equity refers to the differential treatment of individuals with different characteristics. For example, it is generally accepted that children with disabilities require more expensive educational programs than do children who are not similarly disabled. A vertically equitable system would provide additional funds for the education of children with disabilities. Horizontal equity would be maintained if all children with similar disabilities received roughly the same level of resources.

⁵ *Rose v. Council for Better Education*, 790 S.W.2d 186 (1989).

may sound simple on the surface, it represents a major change in the way states – and consequently school districts – will think about school funding issues in the future.

Defining adequacy, which is somewhat akin to the concept of a basic education as established by the Washington courts, requires accurate information on what schools spend to provide educational services to children, and how those resources vary with differing student needs. It may be that the best place to collect the information needed to assess adequacy is at the school site (see Farland, 1997; Monk, 1997; and Picus, forthcoming). School-level data will make it easier to understand what it costs to provide an adequate education to the average student, and provide a better basis for funding students with special needs.

In addition, Farland (1997) has suggested that it will be possible for state departments of education and local school districts to more accurately estimate the costs of new or proposed programs if they have better information on the costs of running schools and the various component programs they operate.

Comparability

A state level effort to collect uniform school-level data would go a long way toward resolving differences in the way districts account for school-level resources – at least within individual states. Today state data collection systems vary from nonexistent to highly detailed accounting systems that allow schools to sort financial data by site, program and/or activity (function) as well as object code. Unfortunately, even within individual states there are substantial differences in how school-level data are reported to districts. Another problem is the accuracy and consistency with which expenditures are coded by district staff. As a result, it is often not possible to make comparisons across districts.

Various states have begun to implement school-level data systems using new software programs in order to improve data comparability. Speakman, et al. (1997) show that a great deal of comparable data can be produced quite quickly using the Coopers and Lybrand produced In\$ight program designed to allocate school resources to one of five categories. In theory, the In\$ight system provides a reporting system combined with a relational database, enabling analysis of expenditures by program across school and central district sites. South Carolina is currently using a similar system to collect school level data from its school districts and has recently entered into a contract with IBM to develop a data system to allow state education decision-makers and policymakers to use these data. Oregon has begun an ambitious program to create a state-wide chart of accounts that must be used by all school districts. When complete, school level fiscal data will be available for all schools and potentially for some curriculum areas at the high school level. At the present time, Oregon does not have a standard chart of accounts at the district level. Other states that have school level data systems in place include Texas and Ohio. Hawaii, which is unique among the fifty states in that there is only one, state operated school district, is also moving to develop a better school level accounting and reporting system, and a number of districts in Utah have begun using the aforementioned In\$ight system.

Longitudinal Analysis

One of the weaknesses of much of the research on the impact of educational resources on student performance is the use of cross sectional data. Rarely are data available for multiple year periods, and often when they are, there is so much variation in how they were collected from year to year as to make longitudinal analyses impossible. Picus (1997a) argues that the consistent collection of school-level data over time would allow

researchers to conduct longitudinal analyses to would fill the gaps found so far in these production function studies. It should be pointed out that district level data could also be used for longitudinal studies.

Issues to Resolve in the Collection of School-Level Data

States that collect school-level data have run into a number of significant problems in the design and implementation of their systems. This section summarizes the many potential pitfalls facing the development of a useful school-level data system. Problems ranging from the use of the data to protecting privacy, as well as accuracy and system comparability and capacity must all be addressed if the data collected are to be useful to state and local decision makers.

Cost and Administrative Burden

Perhaps the most important consideration in designing a school level data system is determining whether or not the value of the data collected will be worth the cost. In July 1998 at the NCES data collectors conference in Washington, DC, Matthew Cohen indicated that Ohio has spent an estimated \$250 million on its school-level information systems in the last 11 years. This includes both costs to the state as well as to local school districts in complying with state requirements. It is a substantial commitment to the information system, and policymakers considering such data collection efforts need to be sure that the information they get is worth the cost.

Oregon has estimated that establishment of its new school level data system will cost as much as \$6 million, and has appropriated \$2.9 million to date for this effort. This figure only represents the costs to the state, and does not include the substantial costs to be incurred by districts in shifting to the new accounting system and training their staff in its use.

Collection of school level data by the state will place an additional administrative burden on school administrators at the district and school level. This burden will result in considerable costs to schools either through the need to hire additional staff, or through lost opportunities to do other things at the school site due to the time spent complying with the requirements of the data system.

Making the Data Useful

If school level data are collected, they must be useful to policymakers, school officials at the state and local levels, and hopefully to researchers. Absent some way to use these data for improving the education system in a state, there is little reason to collect them. Busch and Odden (1997) argue that any state-level data system must include micro-data that is integrated, connected and multidimensional and can be combined in any way desired through a relational database. To be truly useful to state administrators, local school officials, researchers and others, the system needs to be designed to allow users to aggregate and configure data in ways they choose.

Beyond that, it is important that schools and school districts report their data accurately. Both Farland (1997) and Goertz (1997) suggest that an incentive to get school sites to report fiscal and staffing data accurately would be to tie state funding directly to the school site.

Lack of Comparability

One of the major problems analysts have found in looking at school level data has been lack of comparability across districts. Many states have large computer cooperatives that provide data processing services to school districts. Often these cooperatives allow districts to use individually designed reporting systems and then they establish translation tables to create required state reports. Since most states only require district level data, this simply requires aggregation of school level data regardless of the form. This works since most districts want a standard system for all their member schools. However, it is unlikely these cooperatives would be able to provide comparable school-level data for all of their member districts given the variation in the way districts choose to use the cooperative's capabilities. In short, the cooperatives support idiosyncratic school level reporting but maintain the ability to generate district level summaries that meet state requirements. Finding consistent school-level data through such systems is problematic.

Related to this is the need for the state to establish common reporting standards (Speakman, et. al., 1997). Absent consistent accounting classifications and standard definitions of personnel assignments, comparisons across schools will be of limited value. As part of a systematic coding structure, the state would need to provide accurate guidelines for classification of expenditures and staff so school and district officials have the knowledge to place items in the proper category.

Another issue that would need to be considered in school-level equity analyses is property wealth. School finance equity analyses almost always focus on the relationship between wealth and spending. Most schools do not have their own tax base or taxable wealth on which to levy a tax. Consequently conducting analyses that compare wealth would not be possible. It would only be possible to determine how spending or revenue levels varied across schools. Even if school-level wealth measures could be identified, Berne, Stiefel and Moser (1997) argue that student mobility within districts would make accurate measurement of that wealth nearly impossible.

Defining a School

Establishing a clear definition of a school is a difficult task. There are literally hundreds of different school organization models in existence in each of the states and across the nation. For example, what is an elementary school? Most educate children in grades K-5, but some are K-6 or K-8, or in states where kindergarten is not mandatory, there may be schools that serves grades 1-5, or 1-6, etc. Many districts have elected to establish primary centers, meaning an elementary age child might attend grades K-2 at one school and 3-5 at another. There is, of course, nothing sacred about those grade distinctions either. High schools are typically designed to serve children in grades 9-12 or 10-12, but in some smaller communities there are secondary schools that serve children in grades 7-12. Moreover, in many school districts there are other combinations of secondary schools. Perhaps the most difficult to identify are intermediate schools. Generally called middle or junior high schools, intermediate schools contain any number of combinations of grades from 4 through 9 or even 10. While the most common are grades 6-8, other organizational structures are found consistently among school districts.

Beyond defining schools, there are many new institutions that need to be considered. Charter schools, choice and voucher programs, private operators of public schools such as the Edison Project, and home schooling combine to make defining a school a complex task. Designing a school level data system that can accommodate the many different types and forms of schools is clearly a complex task.

Complexity

One of the major problems with state accounting systems is their complexity. Ohio has account strings that are 32 characters long (Cohen, 1997) and Minnesota's are 17 characters (Farland, 1997). While these allow for many different ways to sort and aggregate data, they also increase the probability of mistakes or misclassification of entries. Account codes typically include a number of digits for each component of the entire string. This allows for more detailed classification of expenditures as more of the available digits are used. Often some of the digits are optional, allowing the district or school some flexibility in how they are used while other digits are required and the types of expenditures coded with those digits carefully prescribed.

Infrastructure, Technology and Training

Once created, states need to be sure districts and schools have the capacity to report the data required. This will likely require upgrading of school and district hardware and software, as well as substantial training for staff, particularly school level staff for whom such reporting is new. Oregon is finding that to insure that everyone is consistent in the way expenditures and revenues are coded, a great deal of training is necessary.

In addition, the state must have the capacity to receive and process all of the data collected. For example, Florida collects a wide range of student data five times a year. Each collection has as many as 100 student variables for each of the 3 million students in the state. Given five separate collection points, there is the potential for 15 million student records and as many as 1.5 billion data elements a year. All of these need to be stored, processed and made available to system users. Moreover, links between this massive student database and the staff and fiscal data must also be maintained. Florida has installed a data terminal at each school in the state to facilitate electronic submission of the required reports (Herrington, 1996; Nakib, 1996). Developing the capacity to handle the massive quantity of data collected is crucial to the success of any school-level data system.

As documented by both Hertert (1996) and Picus (1997a), the development of a database with school-level fiscal data in California was a complex and time-consuming task. In the end, researchers were forced to collect hard copy data from school districts and key punch the information themselves. This process took over 9 months to complete and resulted in the input of over 18,000 pages of data, all for just 30 of the state's 1,000 districts. The collection of school-level revenue and/or expenditure data would resolve this problem. Moreover, Berne, Stiefel and Mosser (1997) argue that good fiscal, staff curriculum and assessment data at the school-level would help in the analysis of vertical equity issues as well.

Privacy

Picus (1997a) describes the problems CPRE researchers had in seeking permission to use Florida's student database due to concerns over individual privacy rights. In the case of CPRE's Florida research, the problem was not resolved until the department head holding up approval left the state to take a job elsewhere.

Privacy is a legitimate concern, and it is important that school-level data systems be designed to insure that individual student data elements are properly protected. The NCES addresses this problem by offering site licenses to organizations that wish to look at databases with individually identifiable data. The license establishes certain criteria for how the data can be used, and how it should be stored and protected at all times. Data tapes and CD ROM's must be returned to NCES when no longer in use, and the

government conducts random audits of license holders to insure they are meeting the terms of the license agreement. Violation of the terms of the license can result in fines and jail sentences. Some form of protection needs to be established for state databases with individually identifiable data as well.

How Would School Level Data Be Used?

In considering the relative merits of a school-level data collection effort, it is helpful to understand how others have used similar data in the past. To date, there has been little research using school level databases despite the potential richness of the information that is available. Three types of studies were identified in developing this paper, those using Federal databases like the Schools and Staffing Survey (SASS), those using state maintained school-level databases, and those done through the construction of school district specific school-level databases.

Studies Using Federal Data

One of the earliest attempts to look at school-level data was the work of Picus (1993a and 1993b). By merging data from the SASS with Census Bureau data on governmental expenditures, Picus was able to estimate spending patterns at the school level. Because fiscal data were not available at the school level, the analysis focused on the use of staff. What was particularly interesting in these analyses was the difference between the estimated pupil/teacher ratio and the teacher self-reported class size. He found that while the average pupil/teacher ratio reported in schools was in the vicinity of 16.5 or 17:1, self reported class sizes ranged from 24 to 32 (Picus & Bhimani, 1993; Picus, 1994) or from 50 to 100 percent higher than even school-level statistics indicated. Two important findings emerged from this work. First, it is clear that many individuals classified as “teachers” in our public school systems have assignments other than spending the full day in the classroom. Second, it appears that as the size of the district increases, and as its wealth declines, the disparity between the calculated pupil/teacher ratio and the actual class size grows. Further school level analyses were not possible with the SASS and Census data.

Studies Using State Data

Early work in assessing school-level spending patterns was done by CPRE researchers in Florida, California and New York. In Florida, Nakib (1996) assessed the use of resources at the school-level. He concluded that when analyzed on the basis of district size, total expenditures, district wealth, percentage of minority students, and low income students there was little variation in spending patterns by object, function or program at the district and at the school-level. Nakib was not sure of the cause of these similarities, wondering if the uniform reporting requirements Florida placed on schools and districts was the cause of this consistency in findings. He wondered in his conclusion if spending patterns were similar, what other factors led to differences in school effectiveness. Additional school-level variables might lead to the answer to this question.

In California, Hertert (1996) analyzed school-level equity, finding that despite the substantial district level equity in the distribution of general resources to education, there were substantial variations in the amount of money spent per pupil across schools within districts and among schools across districts. In addition, she found that pupil/teacher ratios were very consistent across school districts and schools, although there was substantial variation in what types of courses were offered in high schools by those teachers. Variation in the number of advanced math and science courses, for example, could be one explanation of why graduates of some schools perform better in these

subjects than do graduates of other schools. In New York, Monk, Roelke and Brent (1996) found that while spending patterns tended to be similar across districts and even schools, the use of personnel varied considerably, with some schools have substantially more resources devoted to high level academic courses than others. Clearly the potential of these differences to impact the level of student learning is important to understanding how resources matter, even if the focus is on teacher qualifications and what they are teaching rather than how much they cost.

Sherman, Best and Luskin (1996) conducted a study of the potential uses of school-level data sets in Ohio and Texas. Many of their findings were similar to district level research reported above confirming the consistency of spending patterns among schools. While Sherman, Best and Luskin found differences in the levels of expenditures for various functions across schools, they found that there was little difference in the share of total expenditures spent on instruction, administration and support services (p. 24).

Recently, Jay Chambers analyzed Ohio's school-level data in an attempt to estimate the costs of special education. He was able to make a number of important estimates of the costs attributable to services provided for children with disabilities. The information he provided is highly policy relevant in understanding how much is spent for special education and what that money buys. Its potential value in other states is very high, although it was Chamber's view that if national estimates were to be attempted, it would be necessary to collect information from each of the states individually. The analysis would be very difficult for those states that did not have state level data like Ohio.

The collection of school level data is a relatively new venture. To date, there has been limited research use of the information collected by Florida, Ohio and Texas (the states with the most advanced school level data collection systems). To a large extent, particularly in Texas, the data are used to provide citizens with a great deal of detailed information on their local schools. To date there has been limited analysis of what those data mean, either by researchers or policymakers. Chamber's work with the Ohio data provides detailed estimates of the costs and personnel allocations for special education in Ohio. The data gives a clearer picture of special education costs than has been previously available, and enables state level officials to compare costs of the same services across schools and school districts.

With further refinement school level data collections on finance, personnel and student characteristics may make it possible to gain a better understanding of how money (and other resources) matter in improving student performance. Policymakers would be interested in these data both to better understand these links, and to help develop measures of the cost-effectiveness of alternative educational strategies and their relative effectiveness with children from different backgrounds and locations.

Studies Using School District Specific Databases

A number of studies have been conducted using databases with school level data constructed from individual district records. Miles (1995) study of Boston showed that if all individuals in the district classified as teachers were placed in regular classrooms, class size could be reduced from an average of 22 to 13. While this change may not really be possible due to the need to provide special services to children with severe disabilities, Miles also provided a number of different policy options showing how the average class size would vary as some of the district's current special education practices were continued. Her analysis provided information that a school board could use to make policy decisions on class size and the delivery of special education.

Recently, Berne and others have conducted a major study of school-level resource allocation in four urban school districts in the United States – Rochester, New York City, Chicago and Fort Worth. In their introduction to a special issue of the *Journal of Education Finance* devoted to this work, Goertz and Stiefel (1998) focus on three things: intra-district fiscal equity, decision making processes, and considerations for implementation of school level databases.

- A number of factors take on heightened importance when school level equity is considered. School level analyses can lead to public comparisons among local schools leading to potential conflicts between the goals of horizontal and vertical equity. Some schools may appear to have more resources than others due to the special needs of the children at the school. While this meets the traditional goal of vertical equity, it may appear unfair to parents of other nearby schools who only see that their school does not have as many resources available to them as the school with the children with special needs. In addition, local constituents don't always understand differences between per pupil positions and per pupil expenditures. Differences in salaries of teachers could lead to lower teacher costs per pupil at schools with relatively more teachers, confounding analyses that rely on expenditures and pupil/teacher ratios.
- In all four of the districts studied, school based budgeting only takes place at the margins with relatively little real discretionary authority allocated to the school sites. Moreover, it is generally the principal who has the most power in making those fiscal decisions which are possible at the school site. It is critical to be clear who is ultimately responsible for the academic and fiscal performance of the school. Where this is not clear, there have been conflicts between site councils and the principal.
- Data on dollars, positions, outcomes and demographics should be integrated into one database. Districts typically keep these data in different data bases. It is typically difficult, if not impossible to merge the data on students, teachers and spending into one, unified database. By maintaining all of these data in one, easily accessible data system, comparisons across students and schools will be facilitated.

In addition to this work, Bruce Cooper and teams of analysts from Coopers and Lybrand have collected and analyzed a great deal of data from New York City Schools and other districts throughout the country. The initial "cascade" model developed by Cooper et al. (1991) attempted to track funds starting at the central office level as they "cascaded" down to the local schools. The model has been revised over time and is now available to school districts through Coopers and Lybrand under the name In\$ight. The model divides expenditures into ten categories, five each at the district and school-level. At each level the same five functions are specified:

- Administration
- Operations and facilities
- Teacher support
- Pupil support
- Instruction

The findings from Cooper's model when applied to eight school districts across the country showed that central office expenditures consumed between six and 20 percent of district expenditures, leaving between 80 and 94 percent for the schools. The model forms the basis of the Ohio school-level data collection and a form of it is in use today in South Carolina as well. Cooper (1998) indicates that Hawaii is looking into the use of the InSight model to track expenditures in the schools that are part of that state-wide school system.

Conclusions

Collecting fiscal, staffing and student data from increasingly smaller and more desegregated levels of the school system makes the task more and more complex. As the pyramid in Figure 1 shows, a state-level data system only has 51 data collection points – the 50 states plus the District of Columbia. District level data systems have over 15,000 data collection points, while a national school level data system would require collecting information from over 80,000 individual schools. Because of differences in reporting requirements – both district and state – as well as the potential for data entry errors at each level, comparing information across units, be they schools, districts or states is difficult.

The complexity of collecting data on educational resource allocation and use is confirmed by the difficulty NCES had in developing a crosswalk to enable it to report state level school finance consistently across the 50 states. In the end, only 39 states were successfully included in the crosswalk due to the difficulties of finding ways to compare individual state systems. As the number of entities included in the database increases, the complexity grows. Although this may be mitigated somewhat by the ability of a state to force districts to accept a standard reporting system, the problem is still immense.

Assuming a state is willing to undertake the expense of developing a school-level data system, what does it gain? It gains a wealth of information that can help state and local decision makers understand how the schools of that state operate and how schools translate resource allocation decisions into student outcomes. Moreover, it can help states develop accountability standards for the schools, making it possible to know immediately which schools are succeeding and which need assistance.

Despite all of the potential for school level data, it is not certain that once the data are collected we will be able to answer all of the questions we have or that we could pose. Recent research in Ohio has shown that once people understand what the data system can provide, they want more capabilities. Continuing to refine and upgrade any data collection system is both important and costly. Berne, Stiefel and Moser (1997:253) state that while many different school level data collection efforts have recently begun, at some point it will be "important to use cost-benefit principles in deciding what kinds of uniform data to gather across schools in a city, state, or the country."

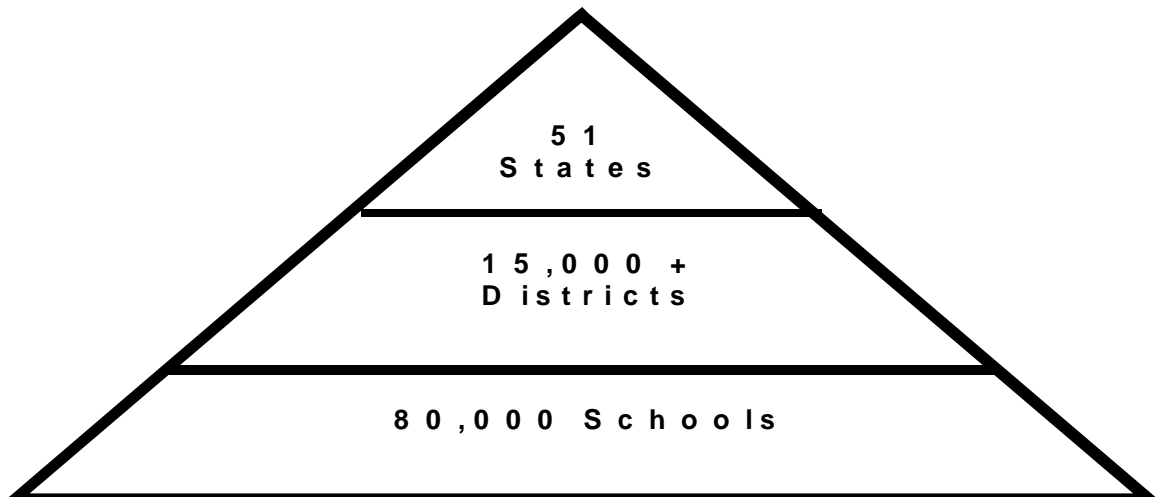


Figure 1: The Data Collection Pyramid

Data collection is only a valuable activity if it is accompanied by clear, well thought out analyses using those data. It is unclear what types of analyses the key stakeholders in Washington want to have conducted. The legislature generally wants to know that the funds they appropriate are being well used, but this has focused mainly on district-level data and the analyses are ad hoc. Moreover, OSPI does not have a capability to conduct analyses with the data they maintain. Until there is a better understanding of how the data will be used, pursuing school-level data may be premature.

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